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Journal of the Society of Arts.

FRIDAY, OCTOBER 26, 1866.

Announcements by the Council.

Examinations, 1867.

The Programme of Examinations for 1867 is now published, and may be had *gratis* on application to the Secretary of the Society of Arts.

In addition to the prizes offered by the Society of Arts, the Worshipful Company of Coach and Coach Harness Makers offer a prize of £3 in Freehand Drawing, and a prize of £2 in Practical Mechanics, to the candidates who, *being employed in the coach-making trade*, obtain the highest number of marks, with a certificate, in those subjects respectively.

Proceedings of the Society.

CANTOR LECTURES.

"On the Synthesis and Production of Organic Substances and the Application which some of them Receive in Manufactures." By Dr. F. Crace Calvert, F.R.S., F.C.S., &c.

Lecture IV.

Delivered on Friday, May 4th.

On the Artificial Production of Aromatic Substances.

It is with pleasure that I am able to announce to you that this lecture is, by the nature of the products upon which I shall have to dwell, one of the most agreeable of this course—the artificial reproduction of aromatic substances.

The artificial production of this class of substances is a subject which must excite interest, for it has reference to many of the perfumes which we use every day for our toilet, and which contribute to the enjoyment we feel when admiring certain flowers. Therefore I shall begin by stating that chemists have produced artificially that fragrant odour which is given off by an all-admired flower called the lily of the valley, and which perfume is identical with that given off by the small yellow flower of the *Spiræa ulmaria*, which grows and perfumes the banks of streams winding through our valleys, and which aromatic principle chemists have also traced in a most odoriferous bean, the tonka bean. What enhances the interest in the artificial reproduction of this aromatic compound is, that it is derived from a white crystallised substance, called salicine, having a most bitter taste, which is obtained from the bark of the willow or the poplar, trees which are often the companions of the lily of the valley and the *Spiræa ulmaria*.

To extract salicine from the bark of the willow or the poplar it is simply necessary to boil it in water, to add a little oxide of lead so as to separate the resinous and other matters in solution, then to concentrate the liquors, when, on cooling, they yield salicine.

Let us now follow the transformations which this substance—which has been employed as a substitute for quinine in cases of intermittent fevers—undergoes to become converted into a product identical with that which characterises the perfume of the lily of the valley, the *Spiræa ulmaria*, and the tonka bean, and which substance has received the name of salicylous acid. To prepare it from the *Spiræa ulmaria*, or the lily of the valley, it is necessary to boil the flowers with a little caustic potash, which unites with the salicylous acid, and in removing that compound from the aqueous solution it is easy to obtain the acid above mentioned. To prepare artificially from salicine, one part of that substance is mixed with one of bi-chromate of potash, 20 of water, and 2½ of sulphuric acid. On heat being applied to the mixture, salicyous acid distils, which, being insoluble in water, is easily separated, and its powerful fragrant odour easily appreciated.

But there is another series of facts connected with this subject to which I desire to call your attention, and which are linked together by the interesting substance salicylous acid. Thus, when this organic compound is heated with potash, it fixes two proportions of oxygen, and becomes transformed into a substance called salicylic acid, which, when liberated from its combination by means of hydro-chloric acid, separates under the form of white and well-defined prismatic crystals, perfectly inodorous, and soluble in water and alcohol. If to this acid we now add wood-naphtha and a little sulphuric acid, they yield, on the application of heat, a most fragrant perfume, which is identical to that imported at the present time in large quantities from America, under the name of essence of winter green, or essence of *gaultheria*, extracted from a small heath plant, or *erica*, which grows wild on the sides of the mountain rocks of New Jersey.

The essence of winter green offers to chemists, and to us this evening, a peculiar interest, owing to the fact that it is a natural ether, that is to say a compound of salicylic acid united with the oxide of methyl; whilst all the other essences and perfumes are hydro-carbons, to many of which I called your attention in my last lecture, as well as to some other hydro-carbons containing in addition a small amount of oxygen. When the discovery was made by Cahour that the essence of *gaultheria* was a natural ether, the chemical world became so excited that they dreamt that they were at once going to reproduce easily every known perfume; and although this has not been realized, still many interesting data have been added to our store of knowledge. As an example I can cite that if the essence of *gaultheria* is heated with caustic baryta, it unfolds itself into carbonic acid and into a substance called anisol, which has a highly pungent odour, and quite different in its properties from that of the substance employed to generate it. On the other hand, if anisic acid, which is easily obtainable from the essence of aniseed, is acted upon in the same way, anisol is also produced, thus showing how closely allied, in a chemical point of view, are the essences of *gaultheria* and aniseed.

Let us proceed to examine together a substance which of late has been much used as medicine, called valerianic acid, and which offers much interest, owing to the various, wide and curious sources from which chemists have been able to extract it. To prepare valerianic acid from the roots of the *Valeriana officinalis*, all that is required is to split the wood into small pieces, to place it with water into a retort, and on heat being applied the water distils, and there floats in it an oily matter, which is valerianic acid, separated easily. This acid can also be obtained by the same process from the guelder rose or water elder, as well as from the repulsive product called oil of porpoise, the odour of which is, in a great measure, due to valerianic acid. It has also been extracted from various classes of cheeses by my learned master, M. Chevreul, who has also traced its presence among the products which result when animal matter is allowed to enter into slow putrefaction.

But what is especially important are the means by which valerianic acid can be artificially produced;

I shall begin by stating that when the essence of camomile is allowed to fall, drop by drop, into melted caustic potash it is oxidised and converted into valerianic acid. Another interesting production of this acid, is one which has been followed of late years in order to obtain it in sufficient quantity to meet the demand which has arisen in consequence of its therapeutic properties, and its employment by medical men, and this is its artificial production from fousel oil, a product which is obtained during the rectification of raw spirits. In fact, it is the entire removal of this substance through distillation that constitutes the art of the rectifier; for by so doing he obtains purer alcohol, which has an agreeable flavour, and which does not injure man but when taken in excess, whilst if it contains the fousel oil, not only is the taste of the alcohol rank and disagreeable, but it appears to have a a peculiar irritating action on the nervous system.

Among the various methods which have been devised for converting fousel oil into valerianic acid, the most effective, I believe, consists in mixing fousel oil with bi-chromate of potash and sulphuric acid, when by the action of the oxygen liberated from the bi-chromate of potash through the action of the sulphuric acid the fousel oil is oxidised and converted into valereanic acid.

As I have called your attention to fousel oil, let me state at once that this substance, which is so repulsive in consequence of its odour, has, notwithstanding, been much employed of late years to manufacture substances used extensively under the name of flavouring essences, that is to say, essences which are employed to impart the flavour of jargonel pears as well as that of apples, to sweet drops, &c.

The first of these essences is produced by mixing together acetate of potash, fousel oil, and sulphuric acid, when the result of the operation is sulphate of potash and acetate of amyl, which compound is, in reality, the essence of the jargonel pear. To prepare that of apples, all that is required is to unite valerianic acid with its derivative the oxide of amyl, producing the valerianate of amyl, or the essence of apple. And allow me to add that the essence of pine apple is a product obtained through the oxidation of olive oil by nitric acid, giving rise to œnanthylic acid, and that when this acid is mixed with alcohol and sulphuric acid, they produce œnanthylic ether, called essence of pine apple. Practice and experience have gradually led to the manufacture of a large variety of these products, most of which are mixtures of various substances obtained through chemical actions, and certainly nothing can be more curious and more instructive than to reflect that such aromatic flavours are derived from products which in reality have most noxious odours, and which are so repulsive in their nature that they are considered mere refuse. It is to Dr. Hoffman that we are indebted for a correct knowledge of the chemical composition of this interesting class of substances.

Permit me to dwell for a few minutes on the artificial production of the essence of lemon, now manufactured in large quantities by the process which I am going to describe, which consists in obtaining it from the essence of turpentine, substances, strange to say, differ one from the other only in the fact that one molecule of turpentine can be unfolded into two of essence of lemon. To effect this splitting (if I may so express myself) of a molecule of turpentine into two of essence of lemon, the turpentine is mixed with alcohol and nitric acid, and the mixture exposed to the rays of the sun, when gradually the turpentine unites with the water, giving rise to hydrate of turpentine; a combination of this substance with six atoms of water, giving birth to large, well-defined crystals, which are separated from the mother liquors in which they have been formed. These crystals, on being submitted to the action of hydrochloric acid, unite with the gas, and give rise to a liquid and a solid substance, which liquid portion, on being acted upon by potassium, gives birth to the essence of lemon. If, instead of operating upon the hydrate of turpentine with hydrochloric gas, we act with it at once on turpentine we shall observe that the gas is absorbed in large quantities, and after a short time a white, solid, crystallised substance will be formed, which on being separated from the fluid in excess, pressed between folds of paper, and then sublimated by gentle heat in a retort, yields a white, crystalline, transparent substance, whose odour is identical to that of natural camphors as they are imported, either from China or the island of Borneo, countries which chiefly supply us with that useful aromatic substance, and which is easily obtained by placing slips of wood belonging to the tribe of plants called *laurus camphora* with water, in iron shallow vessels, and placing over them metallic cones filled with rice straw. On the application of heat the camphor is vaporised, and becomes condensed under the form of small crystals, which attach themselves to the rice straw, from which they are easily removed, collected, and shipped to this country, where they are introduced in large glass vessels, and which are in their turn placed in heated sand baths, when the camphor volatilises, and is re-condensed on the colder parts of the glass vessels, forming large solid white cakes, so well known to us as refined camphor.

There are few substances in the vegetable kingdom which have excited more interest in the chemist's mind, and have called forth more researches, than a seed, the products of which are extensively used in every-day life, and whose composition is still so little known by the public, I mean the seed of the mustard plant. It is necessary that I should state there is a marked difference between white and black mustards, notwithstanding both of them contain starch and a fatty matter. Thus, when white mustard is mixed with lukewarm water, the elements of the seed appear to undergo no modification; whilst if black mustard seed is placed under similar circumstances a most powerful and pungent odour is produced, arising from the generation of the essential oil of mustard. As this oil is the result of the action of an albuminous ferment, mysorine, on a substance called myronic acid, unfolding it into an essential oil, and that this chemical phenomenon is prevented by a temperature of 212°, it therefore follows that whenever it is desirable to produce this oil, which acts as a powerful caustic on the skin, it is necessary that the temperature of the water with which the mustard is mixed should not exceed 150°, for without this precaution the ferment mysorine is coagulated, the chemical action ceases, the essential oil is not produced, and thus the benefit which might result from the application of such a substance under the form of a poultice is not attained. It is no doubt with a view of avoiding the evil results which often occur when mustard seed is used as a poultice, that of late the essence itself has been patronised by medical men.

Among the numerous transformations which chemists have succeeded in effecting in connection with the essence of mustard, the most interesting is its conversion into essence of garlic, which is most easily effected under the following circumstances, namely, heating essence of mustard with potassium, when a certain amount of carbon, sulphur, and nitrogen are removed, which unite with the potassium to form sulpho-cyanide of potassium, the remaining elements being essence of garlic, which, being volatile, is easily diluted.

I cannot do better, as a conclusion of the course, than dwell for a few minutes on the curious relations which exist between indigo and some of the products procured from coal tar; many of them being identical in composition and properties, and are obtainable from both these sources. Thus, if we treat indigotine, which is the colour-giving principle of indigo, with strong nitric acid, we obtain a beautiful yellow crystallised substance, which has received the name of picric or carbo-azotic acid. This acid has a most intensely bitter taste, and has been applied with marked success of late as a tonic and substitute for sulphate of quinine, a remedy for intermittent fevers. Picric acid possesses the curious property that if taken internally for a short time it communicates its colour to the epidermis of man, and thus gives the appearance of suffering from an attack of jaundice. This discolouration, however, is not permanent, for if the person so discoloured ceases to take it internally, the artificial discolouration disappears, and the skin resumes its natural colour.

There are two facts in connection with this colouration of the tissues of man by carbo-azotic to which I should like to call your attention. First, that the period of time of its absorption varies considerably according to the peculiar constitution of the individual, and the disease under which he is suffering; secondly, that the absorption of this matter carries with it the stamp of its presence by colouring the tissues. Physiologists may therefore avail themselves of it to trace into the human system the absorption and penetration of such medicinal preparations as contain this substance

If the production of picric acid was entirely dependent upon the conversion of indigo, we should have to consider it as a curiosity, for its price would be so high, being only a by-product of a costly substance. On the contrary, however, it is manufactured artificially by tons for use as a powerful yellow dye, yielding to wool and silk a most splendid yellow hue, rivalled in beauty by no other known dye. To produce this cheap and beautiful colouring matter a coal tar product is used which I have on several occasions mentioned to you, namely, carbolic acid. By acting on that subtance with, nitric acid, three atoms of hydrogen are removed from every molecule of carbolic acid, and on these being replaced by three atoms of hypo-nitric acid, it is converted into picric, which merely requires to be separated from the excess of nitric acid to be ready for use in arts and manufactures. Another curious instance of the connection existing between tar products and those which are derivable from indigo, is the following:—If indigotine be mixed with caustic potash, and heat applied, a peculiar oily matter is produced, well known by name to all of you, for it is aniline, a substance which you are aware gives rise to those splendid tar colours which we so much admire. This substance, of course, as you also well know, is manufactured in large quantities from coal tar products, especially benzine, by a series of transformations which I have had occasion to explain before in this room.

There are several other substances which chemists have succeeded in preparing and isolating, and which multiply still further the relations between indigo and tar products, but as they are for the present purely of scientific interest, I shall not trouble you with them this evening.

I hope I have laid before you, in this course of lectures, a sufficient number of facts to convey to your minds the belief that chemists will be able, within a few years, to reproduce artificially substances which are now rare and costly, and thereby will enable manufacturers to employ with facility substances which by their high price, are now rendered useless. It will also place in the hands of our manufacturers cheap and commercial productions, which will either be identical or a perfect imitation of those which we now employ, and for which we entirely depend upon the climates of foreign countries. Thus, for example, it is highly probable that chemists will be able to produce artificially morphine, quinine, and a variety of other useful therapeutic agents. On the other hand, they will prepare colours equal to if not surpassing in beauty those extracted from natural products, and time will reveal to them means of giving them permanence. We shall then no longer depend upon India, Mexico, South America, or any other part of the world for our colouring matters. In fact, we shall, as we now partially do, supply to those countries the very shades of colour for which formerly we were entirely depending upon their productions abroad to enable us to enter into the world's field of competition.

Proceedings of Institutions.

LANCASHIRE AND CHESHIRE UNION.—The annual meeting of this Union was recently held at the Manchester Mechanics' Institution, THOS. BAZLEY, Esq., M.P., in the chair. At least 100 delegates from the Institutes composing the Union were present. The report of the hon. secretary (Dr. Pankhurst) stated that the number of Institutes now in the Union is 120, of which 11 have been admitted during the past year, while four have, during the same period, ceased to exist. A summary of returns from 82 Institutes shows that the aggregate number of members is 22,780; the income of 71 Institutes has been £24,186; the number of books in the libraries of 72 Institutes is 131,446; number of members attending evening classes at 64 Institutes, 7,342. The influence of class instruction as an agency for the diffusion of information, and as an instrument for submitting the intellectual faculties to discipline at once systematic and sustained, has always been highly valued by the Council. Their policy and views in this respect have been ably and energetically carried out by the visiting agent (Mr. Lawton), whose undiminished devotion to his work they heartily and warmly acknowledge. Under the auspices of the Council examinations have been held during the past year, under the superintendence of the Local Boards. The Elementary Examination was held in March last. A tabular statement of the results shows that while in 1864 there were 72 pupils, and 171 in 1865, there were this year 82 pupils of the higher grade, and 287 of the lower grade, or 369 pupils in all, examined. To the Final Examination of the Society of Arts, in April last, candidates were sent in by 30 Institutes, of which 23 are in direct connection with the Society of Arts. A classified statement of the result shows that while in 1864 the total number of candidates was 34 of the first class, 86 of the second class, and 127 of the third class; and in 1865 there were 56 of the first class, 100 of the second class, and 124 of the third class, there were this year 35 of the first class, 99 of the second class, and 136 of the third. At 32 Institutes, Science classes in connection with the Department of Science and Art have been in operation during the past year. The results of the examination held in May last were as follow:—Of the first class, 56; second, 70; third, 232; fourth, 113; and fifth, 130. In 1865 the results were—first class, 46; second, 118; third, 212; fourth, 226; and fifth, 251. And in 1864 they were—first, 68; second, 91; third, 128; fourth, 148; and fifth, 122. Special attention is directed to the extension of the examination scheme of the Union by the awarding of special prizes. The object of this extension has been to bring under a higher order of stimulus those members of Institutes who have passed successfully through the elementary stages of education. The character of the topics selected as the subjects to be dealt with present two features of significance. They refer directly either to some of the important local branches of production, or to the great relations brought into prominence by the industrial life of these districts. The following is a list of the results for 1866:—Social Economy—Special Examination: First-class Certificate with £1 prize: Burnley Church Literary, 1; New Mills, 1; Hope Chapel Y.M.S., 1; Waterhead, 1.—Essay—Prize, £5, Bredbury M.I. Society.—Strikes, &c., Essay—Prize, £5, Burnley Mechanics'.—Social and Intellectual Elevation—Essay—Prize, £5, Rawtenstall Mechanics.'—Mechanical Drawing (mill-gearing: 1st prize, £5, Bolton; 2nd prize, £1, Oldham

Lyceum.—Needlework and Cutting-out, £5: Divided between Burnley Mechanics', Staleybridge Mechanics' and Freetown (Glossop) Institute. The special prizes for the ensuing year will be for the following subjects:—"Social Economy," given by the Right Hon. W. E. Gladstone, M.P., ; "Biographies from English History," given by Mr. Thomas Ashton; "Improvements in Machinery, &c.," given by Mr. Hugh Mason; "The Influence of Co-operation on the future of the Working Classes," given by R. M. Pankhurst, LL.D.; "Cutting-out and Needlework," given by Mr. R. Rumney, F.C.S.; "Domestic Economy," given by Mr. William Hoyle; "Calculation of Speeds of Wheels, &c.," given by Mr. Councillor D. Morris; "Mechanical Drawing," given by Mr. Councillor Milnes; "The Wages Question," given by Mr. David Chadwick. The subject of instruction in science has continued to receive the earnest attention of the Council. They have endeavoured to organise a system of science-teaching, which should economise the power at present at command, and which should be adapted to the wants of the members of Institutes, in view both of their industrial pursuits and of the exigencies of their daily life. Since the last meeting, the Department of Science and Art have consented to allow payments on results to elementary teachers engaged in teaching Science classes. The council held the usual annual conference of Science secretaries and teachers, at the Mechanics' Institute, Manchester, in August last. The conference, which was well attended, discussed fully the principles and action of the government scheme, and considered suggestions for its modification and extension. Another great subject has received the anxious consideration of the council. Female education has always occupied a place amongst the agencies of the union. During the past year prizes were offered for special work done by female members of Institutes; but, in order that the educational value of the plan might be maintained, the council made it an indispensable condition of competition that the candidate should have passed a satisfactory examination in the elementary branches of instruction. Boxes of the itinerating library have circulated amongst the Institutes. The income of the union has been £337 10s. 8d., inclusive of £259 17s. 6d. from annual subscriptions, £26 from donations, and £43 4s. from subscriptions from Institutes. The expenditure has been £310 10s.; leaving a balance subject to current liabilities of the month, of £27 in favour of the union, and there are unpaid subscriptions to the amount of £10 13s.—Mr. Lawton, the visiting agent, reported that during the past year he had visited 86 Institutes, and delivered 27 lectures and public addresses. Of the 116 Institutes in union last year, three had ceased to exist, and two had been constituted working men's clubs. One only of these had evening classes. Of the 12 Institutes that had joined the union, three had been established during the year; eight had evening classes in operation last winter; 76 of the Institutes visited had classes for elementary instruction, and 30 had female classes. In some of the Institutes the female classes were vigorously conducted. and well appointed. The most numerously attended classes were at Mossley, Oldham, Waterhead, Freetown, Glossop, Staleybridge, and Droylsden. In addition to the special prizes offered by the uuion, the Society of Arts offers a prize of £2 to female candidates who obtain the highest number of marks in arithmetic, animal physiology, domestic economy, social economy, &c. The scheme of the Department of Science and Art is now generally understood, and, could teachers be secured, arrangements would soon be made to establish classes in all the districts of the union. Several central classes were formed last winter. Convinced that the examination scheme of the union need only to be known to be appreciated, Mr. Lawton arranged in most of the Institutes visited to give to the members of the evening classes a short explanation of the working and advantage of the examinations. As a result, a large number of candidates offered themselves for examination. The attendance of the public at lectures, as a rule, is most disheartening, only twenty or thirty, and in some cases not even that number, attending; but there are some exceptions, and at Bacup the lecture scheme has worked very successfully. At Droylsden a successful course of lectures was given last winter, the interest being sustained throughout. Saturday night entertainments (including readings, recitations, and music) have been remarkably successful at various places. The report concluded with a suggestion that more care should be taken in regard to carrying out the regulations of the Society of Arts in respect to the preliminary examinations.—The Chairman said that he considered the progress made exceedingly satisfactory. He did not wish to measure the time by the days and months which had passed, but by the acts and deeds which had been performed. When he saw 23,000 members in the amalgamated Institutes he thought that it was exceedingly gratifying, for it showed that the cause of education was making rapid progress in this country. After various resolutions of the usual character had been passed, Dr. Pankhurst thanked the meeting for the very kind expression of opinion of the work of the Association which they had given. The operations of the Union had been worked according to a policy, and as the months of the year had rolled round points of the policy had successively invited special attention and regard. In the policy there had been in the past year two prominent features, which had claimed their espccial anxiety. One of those things had been science teaching, and the other female education. With reference to science teaching, they had endeavoured to make the utmost possible use of the present Government scheme. The government scheme was, however, limited as to the amount of aid it supplied, as to the class which it was intended to benefit, and, as a whole, the scheme was of a temporary character. The object of the Association had been throughout, in making use of the government scheme, to prepare the way for some suitable and comprehensive plan of teaching science. The other great subject was that of female education, and he thought the policy of the council in this respect ought to be very plainly stated. That plan had hitherto been to train the intellectual faculties of women, as being the best preparation they could give them for the duties and activities which more especially constituted woman's work. The council for the ensuing year was then appointed, after which resolutions asking the council to consider what modifications, extensions, or otherwise, it was expedient to introduce in the government scheme, and also pledging the council to aid the movement for the education of women by preparing a complete scheme of class instruction, and circulating it for the information of secretaries and committees. In the course of the discussion it was stated by Dr. Watts, that one cause for the prevalence of female crime in Lancashire was the early stage at which the females were released from control and acquired an independence of action. It was also suggested that those who had passed the best examination in physics and science should have a session at Owens College. Thanks to the examiners, the directors of the Mechanics' Institute for the use of the room, and to the chairman, were passed, and the conference was brought to a close.

Yorkshire Union of Mechanics' Institutes.—Morley Mechanics' Institution.—The annual *soirée* of this Institution was held on Tuesday under the presidency of the Mayor of Dewsbury (Mr. R. H. Ellis). The report stated that the Institution had now 172 members, being an increase of 28 on the previous year. The classes and reading-room were well attended, but financially the Institution was not yet a success. Addresses were given by the Chairman; Alderman Carter, Leeds; Mr. Henry H. Sales, Yorkshire Union of Institutes; and the Revs. D. C. Nearey, South Ossett; J. Thirkhill, Holbeck; J. Haslam, Gildersome; G. Southey, and J. Dodsworth.

POPULAR RECREATIONS.

Under the head of "Village Concerts," the following letter has been addressed to the *Times*, and it may be interesting to the different educational Institutions in Union with the Society, and afford hints for a similar action elsewhere. If the musical ability of the country were really looked after and properly cultivated, there appears no good reason why every place having a population of 1,500 persons might not, once in the year at least, make arrangements for holding its little musical festival:—

SIR,—If it be difficult to introduce national education —meaning thereby religious instruction, with a *minimum* of reading, writing, and summings—into villages inhabited by fewer than 1,000 persons, as the evidence before Sir John Pakington's Committee has abundantly proved, it is much more so to bring the people of small villages together and give them amusements sufficiently rational and attractive. An experiment to enlist in a musical concert all classes of the inhabitants in a little village has been recently tried, and has had so great success in all ways as to justify me in asking for space in *The Times* to give details with some particularity, which may enable the same thing to be done, where the inhabitants wish it, in other places as unfavourably situate as the scene of this concert.

The village in question, or rather its parish, contains under 1,500 inhabitants, many of whom live among the sand-hills at a distance from the little place, which, although within 30 miles of the metropolis, yield even blackcock to the sportsman, and once on a time gave cover to the Sussex smuggler, before the dawn of free trade. It has a church with architecture beginning with the Normans (I am not sure that a Saxon bit or two might not be found left in the tower), besides offering specimens of all the broad divisions of English architecture down to the days of modern churchwardenism. In addition to a fair school, the present rector, who is removed by two generations from the poaching and smuggling epoch of the parish, has benevolently built an excellent schoolroom for girls, which, on the occasion of this musical festival, was somehow made to hold 209 persons. Without this room, lent and lighted by the rector, the concert would have been a very dwarfed and insignificant affair, as no one dared to propose the use of the church.

The object and organization of the concert were in this wise:—The first object was to bring all the inhabitants of all classes into good fellowship, to give them a pleasurable and purifying excitement more wholesome than a fancy bazaar—that refuge of country places; and, if we paid our way, to divide the profits among the old women of the parish above 70 years of age. For the organization of this undertaking, we succeeded, after some discussions, in making a committee of ladies of the village who were willing to act together. Their special duty was to make the enterprise well known and to invite co-operation. Besides this, they opened their hospitable doors to the non-residents, who were brought from other parts of the world to assist the village talent, and these ladies gave good cheer for three days, including refreshments to the performers at the concert, which were highly appreciated by the village choir. There was an executive of two musical young ladies and a chairman-director. The lord of the manor offered the use of timber for the platform, and directed its construction; a great printer in London contributed the programmes aud placards, while a young lady undertook the decorations of the room, with the aid of a juvenile committee of assistants she had constituted, and I cannot tell you how many hundred feet of roses and evergreens were made and suspended from the bare-whitewashed walls, and several *coronæ lucis* of a humble sort, producing an artistic effect which I have never seen surpassed for elegance and simplicity in any ballroom.

The choir was selected from the villagers, who had never before practised any secular choruses. After the first practice of "Mynheer von Dunk," which was highly relished, they were overheard saying, "they would like to stay all night to sing it." For a month or two the chorus was drilled by some lady twice in a week in the evening after their day's toil, and they came through the incessant rain of the last month, night after night, without caring a bit for it. We got together two basses, two tenors, two altos, and two sopranos from the villagers, and supplemented them by some more practised amateur friends of the committee, who also fully entered into the spirit of the work, and oftentimes came miles from the neighbourhood to assist. We collected four very good *seconde donne*, four *tenori* and *alti*, and four *bassi*. The chief difficulty experienced in the musical arrangements consisted in conducting the troupe, and for want of an authoritative musical despot the early practice was rather disheartening. Few amateurs are sufficiently sensible of the importance of looking at musical work as a reality, and they too often think a little flatness or sharpness, or a stumble in time, mispronunciation or inarticulation as of no consequence, and trust to its not being perceived. We had a competitive examination for most of our amateur solo performers; but the judge, not being professional, was a coward, and did not dare to say all he felt. My advice to any who wish to get up a village concert is to seek for a professional conductor at the earliest stage, who is an entire stranger to the neighbourhood, and who will not scruple to give good advice to all who are willing and competent to sing or play. If he be a wise man he will make all necessary allowances for amateur imperfections, and carefully cure them as far as may be possible. Somehow hints for improvement were made to reach our amateurs, who took them with patience and good humour, and at the critical time acquitted themselves creditably, and to the perfect content of the audience. It is not every village concert that could obtain such an amateur accompanyist as we did, and still less such a *prima donna*. When I tell you that besides an Italian and French song and Handel's "Sleep," sung brilliantly, she made many of her audience weep at "My mother bids me bind my hair," "Kathleen O'More," and "Wapping Old Stairs," which was permitted only at the cheap concert, where its pathetic homeliness was felt, and that she was lustily encored in all—amateur musical circles in London will know who this kind lady was—who came and stayed two days to sing for "our old women." It was curious to remark how the village people's faces showed their enjoyment of "*Non piu andrai*" and its tune, without understanding a syllable of the words of it. Our amateur *primo basso*, who had been drilled in Rome, sang it excellently, and was encored. We had been promised the services of perhaps the most rising English composer, but a sudden death in his family prevented his coming. A local amateur musician, very competent, who had agreed to act as vice-conductor, acted for him, and gave all the assistance necessary in this difficult post. Among all the many instances of goodwill it should be recorded that the music-seller of the neighbouring town liberally sent over a grand pianoforte of Broadwood's, while the registrar and stationmaster and the little shops of the village efficiently acted as our Mitchells, and Sams, and Cramers, and Chappells. In all, our choir and performers numbered 35 persons, all being amateurs.

It may furnish suggestions to other places to know what performances, after about four weeks' rehearsal and preparation, we accomplished, so I send you the programme, but without the names of the performers:—

PART I.

Duet,—Violin and Pianoforte	Mozart.
Glee,—"All among the barley"...	E. Stirling.
Songs,—"My mother bids me bind my hair" and "Kathleen O'More"	
Glees,— { "Since first I saw your face"	Ford.
Glees,— { "Hark, the lark"	Cooke.
Duet,—"Là ci darem" (Don Giovanni)	Mozart.
Solo and Chorus,—"Povera Rondinella"	Campana.
Ballad,—"The Bailiff's Daughter of Islington" ...	

Four-Part Song,—“The Nightingale”	Mendelssohn.
Song,—“Wapping Old Stairs”	
Trio and Chorus,—“Mynheer van Dunk”	Bishop.
PART II.	
Solo and chorus,—“Come, if you dare”	Purcell.
Trio,—“Fior di Aprile”	
Glee,—“See our oars”	Stevenson.
Solo,—Pianoforte	
Quintett,—“Blow, gentle gales”	Bishop.
Song,—“Ouvrez la Porte”	
Trio and Chorus,—“Glorious Apollo”	Webbe.
Trio (Voice, pianoforte, and violin).—“A bird sat on an alder bough”	Spohr.
Song,—“Non più andrai”	Mozart.
Chorus, with solo,—“La Carità”	Rossini.
“God save the Queen.”	

We gave two concerts—one at 3 p.m., attended by all the quality, whose numerous carriages created a sensation never before experienced in the village breast, and on the following evening we repeated nearly the same concert at 7 p.m. I am bound to say that our evening meeting was far the more hearty and brilliant. We duly consulted the sensitive feelings of the quality at the first concert in our selections—Handel's “Limpid Streams” was rejected as being sacred music, and even at our evening concert our *primo tenore* apologized for singing the “Maid of Islington,” a bailiff's daughter who married a squire's son—a song of dubious morality in a little village.

Our receipts were £18 15s. from the first morning concert, at 2s. 6d. each, and £8 4s. from the second, at 1s. and 6d. (sixpenny admissions proved unnecessary, as the room could have been nearly filled again with shillings), and £1 18s. from programmes, making a total of £28 17s. Our expenses were just under £8, including 5s. paid to the county rates for the services of an efficient constable, and the result has been a donation of a sovereign to each of 21 old women of the parish averaging just above 77 years each, who will thus be enabled to have an additional half ton of coals to warm their old bodies in the winter, besides affording an unusual treat to the villagers, a pleasant gathering of the gentry, a month's useful practice of music, an infusion of some new and not unprofitable ideas, and the promotion of cheerfulness and kindness among the high and low and rich and poor. What has been done in this old Saxon village—which may be found in the Conqueror's survey of Domesday of the county of Surrey—could, I think, be done almost in any other village. The receipt for doing briefly summed up is as follows:—Secure a room to hold a hundred and more people, form a committee to guarantee an expense of five or six pounds, appoint a director with full powers, obtain a professional conductor to select the performers, and appoint his deputy to act in his absence; print some placards to be exhibited in shop windows, name salesmen of the tickets, the number of which will be regulated by the accommodation. Let the chorus be composed of the natives and amateur strangers who are benevolently disposed, have two practices a week for six weeks, and then, if you act zealously and discreetly, and gently and firmly, you will realize a satisfactory concert, and obtain a surplus which can be turned to some useful account. Cathedral towns get up their festivals once in three years, and why not every village in the country?—I am, Sir, your obedient servant, Felix Summerly.

Another writer, signing himself “Duo,” says:—

It is now two years nearly since we attempted the first of our concerts, our plan of operations being as nearly as possible that mentioned by Mr. Summerly as regards obtaining the co-operation of the vicar, the use and decoration of the school room, &c. Like him, we were, perhaps, singularly lucky in possessing a *prima donna* of unusual excellence, who moreover boasted the additional advantage of being able to drill and conduct our little musical troupe; and here let me say no “authoritative musical despot” could have been more implicitly obeyed than was our fair conductor. The rehearsals, or practisings, took about three weeks, and the prices of admission to the concerts were fixed at 1s. and 2s.

Our first concert, given on the 30th of December, 1864, was so successful that it was repeated the ensuing evening, the pecuniary result being a net sum of over £15, which enabled the worthy vicar to distribute a blanket to each of his parishioners over 60 years of age.

Emboldened by our success, we repeated the experiment on the 27th and 29th of December, 1865, with yet greater success, and were enabled to supply the neighbouring female poor with warm flannel clothing.

The E—— concerts, we now hope and believe, are an established annual event, and are looked forward to with almost the same certainty and pleasure as Christmas itself.

A third correspondent, “E. V. H.,” writes:—

As one who has had some experience in organising and directing such concerts, perhaps I may be allowed to give a few practical hints to those who may wish to try their hand at such undertakings:—

1. I am inclined to believe that the success of these entertainments depends very greatly upon your having or not having a competent accompanyist. A good accompanyist is almost of more importance in these cases than a good conductor. As a general rule ladies do not understand the art of accompanying a large body of voices; they are deficient, with some honourable exceptions, in the nerve, the strength of finger, the energy, and the decision which are required in accompanying a chorus of untrained singers. Even with a fair chorus and a good conductor any unsteadiness in the accompaniment is apt to jeopardise the whole performance, and therefore, I would say, first of all take care to secure a person who thoroughly understands the ins and outs of accompaniment.

2. The difficulties of the preliminary practices will be greatly diminished by each of the four parts—soprani, alti, tenori, bassi—practising separately for the first fortnight, and not being allowed to sing together till each part has thoroughly mastered its music.

3. Written copies of the music should never be used, unless it is absolutely impossible to obtain a printed edition; the former are often full of mistakes, and exceedingly difficult to decipher. It is very important that each performer should have a copy to himself.

4. The pleasure of the audience will be greatly increased by distributing to every person present books of the words of the music. This can be done at no great expense, and contributes much to the success of the concert. I had the pleasure of superintending a concert last Christmas at which some hundreds of poor people were admitted on payment of 3d. each, and we were able, not only to give nearly all of them printed books of the words, which they carried away as mementos of the evening, but also to hand over a handsome balance to certain charities which were greatly in need of help. Let others go and do likewise.

THE PRESERVATION OF GRAIN.

As considerable attention has been given of late to the important subject of the conservation of grain, flour, and biscuit, it will not be amiss to refer to what has taken place in France on the subject. Last year a Commission was appointed by the Imperial Government to inquire into and report upon a method of preservation invented by Dr. Louvel. His system consists in enclosing the grain or other substances in cases deprived of air; and the cylinders which he uses are made of sheet iron, and are provided with a man-hole at the top, a hopper below, and a manomètre to show the amount of vacuum obtained in the usual manner by a common forcing pump acting on a stop cock. The examination by the commission took place at Vincennes. Three cylinders were experimented upon, one containing grain, a second flour, and the third sea biscuit; two of these cylinders were set up in a yard without any shelter whatever, and the third within the building, and the object of the commission was to ascertain, first, if fermentation were absolutely prevented, and secondly, if the ravages of insects were entirely prevented. The Commission was composed of Marshal Vaillant; M. Boussingault, of the *Institut;* Dr. Senard, of the Imperial navy; M. Tisserand, manager of the Government agricultural establishments; M. Doisneau, formerly syndic of the bakers of Paris; M. Leconteaux, agriculturist, a member of the Imperial Society of Agriculture; and M. Borie, editor of the *Echo Agricole.* On the 15th of July, 1864, in presence of the commission, fifty hectolitres of wheat of the first quality were placed in one of the cylinders, together with about twenty litres of lively weevils; the cylinder was then closed, and the air extracted until the pressure was reduced by 65 centimetres. It took eight men during 40 minutes to produce this amount of vacuum. In a second cylinder was enclosed a ton of biscuit half destroyed by insects, and in which living worms and weevils were visible. In the third cylinder was enclosed a ton of fine Paris flour. On the 24th of January, 1865, the cylinders were opened in the presence of the Commission, it having been previously observed that the vacuum had fallen to about 35 centimetres, which was principally attributed to the emission of aqueous vapour caused by the rarefaction of the air during the summer. The grain in the first cylinder wss found in a perfect state of preservation. The weevils were completely destroyed, and their carapaces perfectly dry. The insects had been put in alternate layers with the wheat, and the grain with which they had been in contact was perfectly untouched. The wheat was sold in the corn market of Paris afterwards, at the full market price, and a handful of the grain when placed in the ground germinated perfectly. One observation made with respect to this trial was, that grain containing an excess of humidity would, in the apparatus of Dr. Louvel, be brought into proper condition by the mere effect of the vacuum produced, a great advantage in the case of grain harvested in wet weatner.

The biscuits contained in the second cylinder were in the same condition as when enclosed; but all the insects were dead and completely dried up.

The flour was found perfectly good, and bread made from it was declared of first quality.

The opinion of the commission was entirely favourable to the plan of Dr. Louvet. Two of the cylinders had been exposed for more than six months to the effects of heat, rain, snow, and pretty sharp frost; yet the contents were in perfect preservation, and all the insects destroyed. As regarded the cost of the apparatus and its maintenance, the following particulars are given .—The cylinders for 50 hectolitres (actual contents 53·450, 2·10 metres high, 1·80 in diameter, and weighing 1,400 kilogrammes (nearly a ton and a-half), cost 840 francs (£33 12s.), including the inventor's charge and the manomètre; the expenses of the other accessories, transport, &c., raise this figure to £40. Calculating the interest on this sum at 8 per cent. this would give an expense of about 16d. per 22 gallons, but which would be diminished in the case of larger cylinders to about 11d. To this must be added the cost of the pump, from £12 to £48, or its hire. A great recommendation in favour of Dr. Louvel's plan is the absence of any necessity for housing the cylinders, which only require a coat of paint every third year, and the contents are secure not only against weevils, but also against rats and all other depredators, as well as fire, while a simple examination of the manomètre tells whether all is right within.

The same system is coming into use in France for the preservation of hops. The cylinders are made to contain about one hundredweight, and are tinned. The cost in this case is trifling compared with the importance of preserving the aroma of the hop, and prevention of loss in weight is also deserving of notice. When it is considered how thoroughly established is the principle of the exclusion of air in the preservation of organic substances, the wonder is not that the application should be extending, but that its extension should have been so long delayed.

NEUMEYER'S NEW POWDER FOR GUNS AND BLASTING.

The new powder discovered by Herr G. A. Neumeyer, a manager of stone quarries at Taucha, near Leipzig, is said (Berg- und hüttenmännische Zeitung, No. 36, 1866, p. 309) to possess the following properties:—

1. The powder burns, but does not explode if the air has access.

To prove this the following experiments were made last year at Altenburg in presence of the Town Council:

(*a.*) An earthenware drain pipe, about 11 inches long and 4½ inches internal diameter, was placed upon a brick and buried in the ground for two-thirds of its length; it was then filled with about 4½ lbs. of Neumeyer's powder and this lighted. The powder burnt quietly, merely sending up a long flame. After the experiment the drain pipe was found to be quite uninjured.

(*b.*) A conical earthenware tube, 15½ inches high and 4½ inches in diameter at the bottom, and rather more than 1 inch at the top, was buried in the ground for two-thirds of its height, and filled up to the mouth with about 1 lb. 6 oz. of Neumeyer's powder. On being lighted, the powder burnt somewhat quicker than in experiment *a*, but the vessel was uninjured.

(*c.*) An earthenware bottle, with a large body and very small neck, was filled with 1 lb. 10 oz. of Neumeyer's powder. It burnt very quickly, giving a long flame; the upper part of the vessel broke off in consequence of the great heat and fell down by the lower part.

As counterproof a similar, but smaller, vessel was filled with about 9 oz. of ordinary powder; it exploded with a loud report, and the vessel was broken into numberless fragments which were scattered about for a great distance.

(*d.*) A very instructive experiment was performed with an iron gun-barrel 2 feet long and ¾ inch in diameter. The barrel was filled up to the muzzle with Neumeyer's powder, and this was lighted through the touch-hole. The powder burnt, sending out a curved flame through the touch-hole, and it was only the last portions that were projected in a small flame from the muzzle.

On the 27th November, 1865, the following experiment was made in a quarry at Taucha, and shortly afterwards it was repeated before a large assembly at Altenburg. A small house was built, 4 feet 8 inches high, 2 feet 6 inches long, and 2 feet 6 inches deep, the walls being 5½ inches thick. In front an opening for a door was left, 11 inches square, and at each gable end there was a window 3¾ inches square, closed with thin boards. A wooden box with 33 lbs. of Neumeyer's powder was put in through the opening for the door, which was then closed with a piece of sheet iron. The powder was ignited by a fuse; it burnt without making any impression on the house, and even the wooden box retained its shape, being merely charred. To show the contrast with ordinary gunpowder, a pound of this, loose as in the previous case, was put in the little house. On its being ignited, the house was shivered into pieces.

2. Neither pressure nor percussion will cause it to ignite.

3. Its explosive force is equal to that of ordinary powder or even greater.

4. It leaves behind less residue than ordinary powder.

5. It does not attract more moisture from the atmosphere than ordinary powder.

6. It leaves behind less powder-smoke than ordinary powder. Its smoke, moreover, is light, disappears quickly, and has no injurious effect on the health of the workmen.

7. It is cheaper than ordinary powder in the proportion of 30 to 31. The prices by weight are the same, but as it has been found that 76½ grains of Neumeyer's have the same explosive force as 79½ grains of ordinary powder, the above proportion may easily be deduced.

It seems, then, that Neumeyer's powder is as strong as ordinary gunpowder in spaces that are made as far as possible air-tight, but that when the air has access it burns without exploding. If this is really the case, we gladly agree with Herr Wohlfahrt, Inspector of Mines in the Duchy of Saxe Altenburg, who adds the following concluding words to Herr Neumeyer's pamphlet:—

"I must really call Herr Neumeyer's discovery a blessing for mankind when I look at the frightful accidents caused by explosions, which recur year after year in all quarters of the globe. I need only recall the great explosions at Mayence and Erith, and that which happened lately in the laboratory of M. Aubin in Paris. All imaginable precautions, the strictest regulations, and the most expensive arrangements for transport and storing, do not strengthen the thread by which the life of those who have to do with gunpowder must always hang. How many soldiers are killed in battles when an ammunition waggon explodes, and how much greater is the disaster when the powder magazine explodes on board a man-of-war! All these disasters in war and in peace will be avoided by the use of Neumeyer's powder. Accidentally ignited it will burn out quietly, whether in a massive tower, in ammunition waggons, or on board ship, but will not explode. It will at most lift up the valves which should be fixed to the cases, and probably will not cause the fire to extend to other combustible materials, for I expect it will have a similar effect to Bucher's fire extinguishers. Just as the spectators stood only five paces from the little house when 33 lbs. were burning, so one will be in perfect safety at a short distance when several tons are lighted."

Fine Arts.

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Enlargement of the National Gallery.—The recent purchase of new pictures renders the need for additional wall space more than ever imperative. It is with the greatest difficulty that the existing pictures can be hung; chronological sequence has in some measure to be broken, and pictures which students would like to examine on a level with the eye are crowded away to a fourth line at the ceiling. How room will be found for further acquisitions which may be made within the next two years it is difficult to conjecture. About that time the academy will probably be in a position to surrender to the National Gallery the rooms they now hold; thus the present gallery will be nearly doubled. This additional wall space is not more than sufficient for the works at present in Trafalgar-square. The pictures of the English school must thus remain at Kensington till the new building at the rear of the square shall be erected. The total space then provided for the National Gallery, British and foreign, will be nearly four times the present area, and the collected pictures and drawings will reach about 1,000. The following is an approximation to the number of works in the leading continental collections: In the gallery in Milan 503, in Turin 569, in Venice 688, in Naples 700, in Berlin 1,250, in Munich, new and old, 1,480, in Vienna, 1,550, in the Uffizi, Florence, 1,200, in the Louvre 1,800, in Madrid 1,833.

W. Mulready, R.A.—The bust of the late William Mulready, by H. Weekes, R.A., exhibited in the last Royal Academy, is now placed with other memorial works in the entrance hall of the National Gallery.

Life of Holbein.—Mr. Wornum has completed the letter-press of his life of Holbein: and the handsome volume only awaits some few illustrations. The ornamental letters and the head and tail pieces are all from the designs of Holbein. The work will contain about fifty illustrations, including photographs from two of the celebrated drawings in the Windsor collection. This life, to which Mr. Wornum is known to have devoted long study, will discuss and probably set at rest many moot points such as those relating to the will of Holbein, the date of his death, and the genuineness or otherwise of the 63 reputed Holbein portraits recently exhibited at Kensington.

Paintings at the Louvre.—At the present time the gallery of paintings at the Louvre contains 2,000 pictures, of which 560 are of the Italian school, 620 of the Northern schools, 700 of the French school, 25 of the Spanish school, and the remainder of various schools. In the Italian school may be numbered 12 paintings by Raphael, 3 by Correggio, 18 by Titian, 22 by Albani, 13 by Paulo Veronèse, 9 by Leonardo di Vinci, 8 by Perugino, 4 by Giorgione. The Northern schools are represented by 22 Rubens, 22 Van Dycks, 11 Gérard Dows, 17 Rembrandts, 11 Philip Wouvermans, 14 Teniers, 7 Adrian Ostades, 6 Ruysdaels, 2 Holbeins, 11 Berghems, 10 Van Huysums, 3 Lucas Van Leydens, &c. The French school is represented by 40 pictures by Poussin, 48 by Lesueur, 16 Claude Lorrains, 20 by Philippe de Champaigne, 17 by Sebastian Bourdon, 26 by Lebrun, 12 by Mignard, 41 by Joseph Vernet, 1 by Largillière, 1 by Watteau, 13 by David. Of the Spanish school may be counted 11 Murillos, 6 Velasquez.

Manufactures.

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Cloth from Hops.—The stalk of the hop plant has already been employed in the manufacture of paper; but M. Van der Scheldon hopes to make use of it as a textile material, and to obtain from it a coarse cloth of good quality. The following is the process recommended by M. Van der Scheldon for this purpose. After the flowers of the hop have been gathered, the stalks are cut, made into bundles, and steeped like hemp. The maceration is the most important operation; for if it is not done with proper care, it is very difficult to separate the threads of the bark from the woody substance. After the stalks have been well steeped, they are then dried in the sun, beaten like hemp with a wooden beater, and thus the threads are loosened easily. They are then carded, and are ready for weaving in the usual manner. By this means a strong cloth is obtained. The thickest stalks also produce a thread suitable for the manufacture of rope.

A New Use for Barytes.—Sulphate of barytes, sometimes known as heavy spar, has been extensively used for many years to adulterate white lead in painting, being so much cheaper, and of a finer white. Address and visiting cards were formerly coated with white lead, but this enamel, and, consequently, the printing on it, was liable to be wiped off. Prepared barytes is durable, and consequently preferred. A very great impetus has been given to the use of barytes by the paper collar trade. When the collars were covered with white lead, there was reason to fear that health might be endangered by the pores imbibing this deleterious substance. Barytes has therefore been substituted with so much success that twenty tons per day are used in New York City in the collar manufactories alone.

Commerce.

◆

Oyster Culture in Spain.—A portion of the submarine telegraph cable between the mainland and the Balearic Islands being recently taken up, a quantity of oysters were found attached to it; this leads to the inference that the oyster might be propagated on the Spanish coast if proper beds were established for it.

Salmon Fishery in the Baltic.—Nearly all the salmon caught for a considerable zone on that coast is brought to Leba, a small port on the Prussian coast, where it is cut up, salted, smoked, and exported, principally to Dantzig, Kœnigsberg, Bromberg, Stettin, and other ports. In good years this small place furnishes 80,000 to 100,000 pounds of salmon. In these parts the fishery furnishes cod fish in large quantities and of excellent quality; prepared in the same manner as the salmon, this fish has become an article of commerce.

The Vintage in France.—From intelligence received from the different wine-growing districts in France, it appears generally that the vintage this year has been very satisfactory. About Chalons the returns of the vintage surpass by a quarter at least that of 1865, but the quality is generally indifferent. In the Macon district the produce appears to be this year about 45 hectolitres per hectare; last year being but 30 hectolitres. The wine is of moderate quality, and some is good. In the Beaujolais, one of the most favoured districts, both as regards quality and quantity, several sales of wines from the environs of Villefranche have been made at from 40 fr. to 42 fr. per double hectolitre. The quality of the wines of Revermont is very superior to that which was anticipated. In many vineyards it was necessary to suspend the vintage, as the vintage tubs were filled, and to wait till one tub had been drawn to use it again in order to finish the vintage. The new wine of 1866 has now begun to be sold retail. The quality of the wines of the Lyons districts is pretty good; the first tubs that have been tried have produced a lighter coloured wine than that of last year, but rather fiery; the last tubs, as usual, are better than the first, the grapes being riper with which they were filled. In a few days the vintage will be completed.

The Cotton Crop in Majorca.—The cotton plantations have produced excellent crops in Majorca. The quality of this year's produce surpasses the best of that of the United States.

Postal Anomaly.—There is no book post between this country and the United States of America, while there is a book post between France and the latter country; and what is still more strange is that this French service all passes through England. A New Yorker sends to a Paris house for an English book because he cannot get it direct from English publishers; the Paris house procures it from England and posts it in France for his New York correspondent, and the book thus posted goes through England to reach New York. It is said that the want of an international copyright between England and the United States is the cause of this anomaly, the Americans not desiring to give direct facilities for the introduction of English books, the sale of which would interfere with their reprints, for which they pay the English author nothing. Be this as it may, the fact remains as stated above.

Colonies.

A Branch Exhibition, preparing for the Intercolonial Exhibition in Melbourne, has opened at Beechworth with much ceremony. Nearly every district was represented.

Telegraphic Communication with Australia.—A representative of the Netherland India Steam Navigation Company has submitted to the chief secretary a proposition for the establishment of a line of electric telegaph from South Australia to Adam's Bay, through Victoria, New South Wales, and Queensland, *vià* Cape York and Burke Town. A submarine cable would be required to connect Adam's Bay with Zimor, another would have to be laid from Zimor to the north of Java, thence to Singapore, thence to Malacca, to Moulmein in the Burmese Empire, and thence to Europe, *vià* Calcutta. The estimated expenses of the line from Burke Town is £33,000. The length of the submarine is computed at 1,420 miles; thus Adam's Bay to Zimor 480 miles, thence to Malacca 480 miles, thence to Java 460 miles, estimated to cost £198,800, to which is to be added £33,000, the estimated cost of the line from Burke Town to Adam's Bay, together equal to £231,800, and allowing £57,950 for extra charges, the total cost of the line would be about £289,750.

Spirit Manufacture in Australia.—It appears by a Perth (Western Australia) paper that another memorial is likely to be forwarded to the home government to rescind the prohibition of distilling in the colony, from which native industry still suffers. Some four years ago a vineyard distillation ordinance was enacted by the colonial government, but not sanctioned by the home authorities. This ordinance made it lawful for vine-growers to distil the produce of their vines, and to fortify wine manufactured in the colony free of duty. The absence of these facilities, considering the amount of land well adapted for vine cultivation, is said to constitute a serious grievance, and to form a material hindrance to colonial progress.

Tariff in Tasmania.—The colonial ministry have proposed to do away with all the customs' duties with the exception of those chargeable on spirits and tobacco, with the view of encouraging trade, commerce, and population to Tasmania, and instead of these duties to make good the revenue by a tax to be levied on all the annual value of property and on all incomes upwards of £80, in Tasmania and its dependencies. It was further proposed that after 31st December next, ships arriving and departing from the Tasmanian ports should be relieved of harbour dues and wharfage, and instead of this a sum equivalent to the amount thus to be withdrawn from the marine boards, or such sum as may be required, to be paid out of the general revenue. These changes the ministry propose should come into operation on January 1st, 1867.

Queensland Cattle Trade.—An effort is being made at Bowden to establish the export of cattle from that port to the East. The *Australia* sailed for Batavia from Bowden with 300 sheep and 75 head of cattle on board. The speculation is a promising one, as beef is said to be worth 1s. per lb. at Batavia.

The Pastoral Interest in New South Wales.—A colonial paper states that the mild weather that has followed the rain has given so good a supply of young grass, that it is fully expected that a fair average percentage of lambs will be reared. At the same time, the experience of the last two years has had the effect of drawing attention to the necessity for making provision for a permanent water supply for stock. Dam making, tank sinking, and in the back country boring for wells, is now becoming very general, and would be even more so had the Crown tenants anything like a certainty of tenure. The attention of squatters is now limited only to spots that are not likely to tempt the free selectors, or blocks that may have been purchased. It would evidently be of little benefit to construct a reservoir or tank, if the land around could at once be taken up under conditional purchase. In connection with sheep farming, the nuisance and loss attending the passage of travelling sheep, not travelling for *bonâ fide* purposes of exchange or sale, has at last excited very general complaint and remonstrance. The Crown tenant who, to keep his stock in good condition, does not overstock his run, and thinks thereby to preserve a bit of feed for bad times, is liable to have all his cherished grass eaten off by the first speculative proprietor of ten or twelve thousand sheep who may hear of the little bit of feed. Some of these persons have no runs at all. Others have runs capable of carying say ten thousand sheep and keep twenty thousand on them. Of course, when the feed is gone, the sheep would starve, were not the expedient of travelling resorted to. In this way the steady persevering man is victimised by the sharper and more knowing. Except in the high table lands, where the frosts are heavy, and snow storms have already commenced, cattle generally are improving in condition, and the new spring of grass will give them strength to bear any heavy weather they may have to encounter between now and the spring.

Notes.

Ecole des Ponts-et-Chaussees, Paris.—Since the year 1854 the public has been admitted to the courses of instruction in this important engineering school, the only formality being an application to the director. The session commences in November, and the subjects announced for the year 1866-7 are as follow:—Roads, bridges, railways, inland navigation, marine works, resistance of materials, steam engines, geology, mineralogy, agricultural hydraulics, administrative regulations, and political economy.

Progress of Education.—It appears by some American journals that the tribe of Ottoway Indians have imposed upon themselves a contribution, the produce of which is to be devoted to the establishment of a university. China is also sending to Europe new missions composed of learned mandarins, who are to study the laws of various nations, and to make a report from which the Emperor of the Celestial Empire may be able to judge the modifications that can best be made in Chinese legislation.

Italians in Foreign Countries.—The number of Italians established in different countries of the world are as follows: — In France, 76,500; in Algeria, 7,400; in England, 4,500; in Switzerland, 13,809; in Egypt, 15,060; in Tunis, 6,006; in the United States, 40,000; in Brazil, 18,000; at Buenos Ayres, 10,000; in Peru, 8,000; making a total of 100,000 Italians residing in foreign countries. The inhabitants of the Ligurian provinces and of Como are those that principally emigrate. Unlike the Irish and German emigrants who leave their country without thinking of returning, the Italians go to seek their fortune abroad with the hope of returning one day to their native country.

Medals for the Discovery of Photography and the Electric Telegraph.—Two medals, of large diameter, have recently been struck at the mint at Paris, to commemorate the two principal discoveries of the age, photography and the electric telegraph. The dies were engraved by the two eminent artists, MM. Oudiné and Bovy. Photography, by M. Oudiné, is allegorically represented. A female figure holds in one hand a metallic plate, whilst the other, pointing to the heavens, commands the light to print on it the required image. The nobleness of the attitude, and of gesture, the good arrangement of drapery, all tend happily to express the idea of science subduing matter, and converting the sun to an obedient servant. Another female figure, or rather winged genius, represents the electric telegraph, her feet just touch a galvanic battery, and her arms extend over the dials of the instruments, whilst telegraphic wires crossing each other seem to seize on its passage the thought that flies from pole to pole, and write it by means of nimble pens. The lightness and grace required for such a subject have found an elegant interpreter in M. Bovy. The figure, though somewhat ethereal, is treated with exquisite feeling, and the floating draperies have the motion, the suppleness, that is so admired in the works of Coysevox, Lemoyne, and Couston. These medals may be purchased at the sales room of the Hôtel des Monnaies.

Paris Exhibition of 1867: Free Visits for Workmen.—In several Departments the General Councils at their recent meetings have voted special funds for paying the travelling expenses and costs of stay in Paris for a certain number of workmen, selected by their companions to visit the Paris Exhibition in 1867. The government, also uniting in this idea, have turned their attention to in extending it also to the various agricultural and manufacturing centres. A state grant will complete the sums allowed by the departments, and already increased by the mutual aid societies and by public meetings. These have treated about the stay in Paris, which will be of about a month. As to travelling expenses, the railway companies have offered with laudable alacrity to grant free passes to the delegates from the bodies of workmen and from the agricultural districts.

The proposition made to send from California a section of the "original big tree" (*Wellingtonea*) to the Exhibition at Paris is said by Dr. Macgowan to be impracticable, for want of a saw long enough to cut it. The cutting will require a saw forty feet long.

Civic Honour to Genius.—The new Italian government seems fully alive to the debt which its country owes to genius, and has already exhibited on many occasions a laudable desire to pay due honour to the memory of those whose labours have made Italy one of the most envied amongst nations. The authorities of Milan have just decided that forty-five commemorative tablets shall be set up in the principal streets and squares of the city, each one bearing the name of an illustrious Italian, and recording the most remarkable acts of his life. The following is a list, nearly complete, of the names selected for the purpose:—Pétrarch, Corio, Mosone, Léonardo di Vinci, Girolamo Cardano, Bonaventure Cavalieri, the poet Maggi, Ludovico Muratori, Georgio Giulini, Pietro Verri, Beccaria, Gaetana Agnesi, Giuseppe Parini, Ugo Foscolo, Volta, Melzi, Appiani, Canova, Oriani Monti, Melchior Gioja, Romagnesi, Carlo Porta, Thomas Grossi, Pompeo Litta, Carlo Ottavia, Castiglioni, Jean Berchet, and Massimo d'Azeglio.

Literary Institutions in Paris.—Several attempts have been made, during the last few years, to establish popular institutions in Paris for literary and scientific purposes, but the success has not been great, the regulations respecting association have stood greatly in the way of such endeavours, and the rates of admission have, in consequence, been necessarily too elevated for the means of the majority of the public. A new and bold attempt is now being made. A special building to be applied to the purposes referred to has been erected in one of the best positions in Paris, close to the new opera, at a cost, it is said, including decoration, of a million of francs. The new Athenæum is to be devoted to literary and scientific lectures and *conférences*, or *entretiens*, as they are generally called in France, and also to classical music. It is hoped that the doors of the new institution will be opened early in November. The following are amongst the names of professors and others submitted to the Minister of Public Instruction, whose sanction is necessary in the case of each lecturer:—MM. Babinet, Bandrilla, Beulé, Delaunay, Janet, Maury, all members of the Institute of France; MM. Caro, Gaudry, George, Ville, Wurtz, Perdonnet, Riche, and Leon Say, in science and political economy. Amongst literary men are M. Emile Augier and Legouvé, members of the Academy of France; Paul Féval, Théophile Gautier, Jules Janin, Taine, and Weiss. This is a remarkable array of talent, and, if circumstances turn out propitious, the new Athenæum should have a brilliant future.

Correspondence.

THE ELECTRIC TELEGRAPH OF ENGLAND.

Sir,—I request the favour of your inserting in your impression of this week, the accompanying award of the late Sir Isambard Brunel and Professor Daniell, in an arbitration which took place in 1841, on some controverted points as to the invention and origination of the electric telegraph.

With the award, which you will observe is ratified by the signatures of both of us, I send two volumes published by me in 1856 in consequence of circumstances fully explained in the preface to the first volume, which I hope the Society of Arts, as guardian of the history of practical science, will allow to be placed in its library.

The first volume contains three pamphlets published by Professor Wheatstone and myself in 1854 and 1855, arising out of an article which had appeared in the *Quarterly Review*. The second volume contains copies of the statements and drawings which were before the arbitrators.

My excuse for troubling you with this letter is that the *Times* is claiming for Professor Wheatstone the sole invention of the electric telegraph, and refuses insertion to letters from my friends calling attention to the award. —I, am, &c., William Fothergill Cooke.

Aberia, Carnarvon, Oct. 24, 1866.

Award.

As the Electric Telegraph has recently attracted a considerable share of public attention, our friends, Messrs. Cooke and Wheatstone, have been put to some inconvenience, by a misunderstanding which has prevailed respecting their relative positions in connexion with the invention. The following short statement of the facts has, therefore, at their request, been drawn up by us the undersigned Sir M. Isambard Brunel, Engineer of the Thames Tunnel, and Professor Daniell, of King's College, as a document which either party may at pleasure make publicly known.

In March, 1836, Mr. Cooke, while engaged at Heidelberg in scientific pursuits, witnessed, for the first time, one of those well-known experiments on electricity, considered as a possible means of communicating intelligence, which have been tried and exhibited from time to time, during many years, by various philosophers. Struck with the vast importance of an instantaneous mode of communication to the railways then extending themselves over Great Britain, as well as to government and general purposes, and impressed with a strong conviction that so great an object might be practically attained by means of electricity, Mr. Cooke immediately directed his attention to the adaptation of electricity to a practical system of telegraphing; and, giving up the profession in which he was engaged, he, from that hour, devoted himself exclusively to the realization of that object. He came to England in April, 1836, to perfect his plans and instruments. In February, 1837, while engaged in completing a set of instruments for an intended experimental application of his telegraph to a tunnel on the Liverpool and Manchester Railway, he became acquainted, through the introduction of Dr. Roget, with Professor Wheatstone, who had for several years given much attention to the subject of transmitting intelligence by electricity, and had made several discoveries of the highest importance connected with this subject. Among these were his well-known determination of the velocity of electricity, when passing through a metal wire; his experiments, in which the deflection of magnetic needles, the decomposition of water, and other voltaic and magneto-electric effects, were produced through greater lengths of wire than had ever before been experimented upon; and his original method of converting a few wires into a considerable number of circuits, so that they might transmit the greatest number of signals, which can be transmitted by a given number of wires, by the deflection of magnetic needles.

In May, 1837, Messrs. Cooke and Wheatstone took out a joint English patent, on a footing of equality, for their existing inventions. The terms of their partnership, which were more exactly defined and confirmed in November, 1837, by a partnership deed, vested in Mr. Cooke, as the originator of the undertaking, the exclusive management of the invention in Great Britain, Ireland, and the Colonies, with the exclusive engineering department, as between themselves, and all the benefits arising from the laying down of the lines, and the manufacture of the instruments. As partners standing on a perfect equality, Messrs. Cooke and Wheatstone were to divide equally all proceeds arising from the granting of licenses, or from sale of the patent rights; a per-centage being first payable to Mr. Cooke, as manager. Professor Wheatstone retained an equal voice with Mr. Cooke in selecting and modifying the forms of the telegraphic instruments, and both parties pledged themselves to impart to each other, for their equal and mutual benefit, all improvements, of whatever kind, which they might become possessed of, connected with the giving of signals or the sounding of alarums by means of electricity. Since the formation of the partnership, the undertaking has rapidly progressed, under the constant and equally successful exertions of the parties in their distinct departments, until it has attained the character of a simple and practical system, worked out scientifically on the sure basis of actual experience.

Whilst Mr. Cooke is entitled to stand alone as the gentleman to whom this country is indebted for having practically introduced and carried out the electric telegraph as a useful undertaking, promising to be a work of national importance; and Professor Wheatstone is acknowledged as the scientific man whose profound and successful researches had already prepared the public to receive it as a project capable of practical application; it is to the united labours of two gentlemen so well qualified for mutual assistance, that we must attribute the rapid progress which this important invention has made during the five years since they have been associated.

(Signed) M^{c} I^{D} Brunel.
J. F. Daniell.

London, 27th April, 1841.

London, 27th April, 1841.

Gentlemen,—We cordially acknowledge the correctness of the facts stated in the above document, and beg to express our grateful sense of the very friendly and gratifying manner in which you have recorded your opinion of our joint labours, and of the value of our invention.

We are, Gentlemen, with feelings of the highest esteem, Your obedient servants,

(Signed) William F. Cooke.
C. Wheatstone.

Sir M. Isambard Brunel, and
J. F. Daniel, Esq., Professor, &c., &c.

Well Water and Sewage Gas.—Sir,—The surface wells of the metropolis, once the boast of localities for coolness and sparkling purity, are now sadly degraded in public esteem. Almost every London parish churchyard in an actual thoroughfare, has now or had but a brief period since, its ornamental pump, erected by the generosity and collective wisdom of its parish management; the economist of the parish standing aside and allowing the pump, like the beadle, to be a notable parochial object, the embodiment of utility and ornamentation. In some cases, as in this parish of St. James's, a parishioner has erected, opposite the churchyard in Piccadilly, a costly structure that told its tale of generosity, at a cost exceeding £200. What should we think now of a parishioner whose benevolence was gratified by the erection of a pump opposite the churchyard with its rusty ladle to slake the thirst of the tired wayfarer? The sad mortality during the past summer is again directing attention to well water, for with a surrounding soil such as London surface soil has become, impregnated with gas and defiled with impurities, the wells themselves, "out of sight out of mind," becoming frequently the receptacles for the leakage of defective drains and sewers, as a source of water supply for drinking purposes, now meet with unqualified condemnation. This parish formerly had twelve wells, four of which are now filled up, and this course, judging from the past, may be pursued with the remaining eight, and the same action will doubtless progress through the other parishes of the metropolis, whilst at the same time flushing and water supply for that purpose become an item of considerable parochial cost. To utilise the water supply from these wells, and instead of filling them up, to divert the water into the sewers throughout London or its flat portions, wherein the sewage now passes, evolving gaseous products that fill the air with impurity would, in my opinion, be of great advantage. The Middlesex portion of the metropolis would be found to have a sufficient natural fall towards the Thames to admit of this being done, were not the surface covered with costly structures that present a difficulty as to choice of way, and thus the question, how to divert and utilise this natural supply for the cleansing of our sewers, so that the result in each case may be worth the cost, becomes an important problem for the hydraulic engineer, and one of which the solution must not be delayed, or it will otherwise become impossible, as most parishes will have done what we have already done with one-third of our wells, filled them up. If the Government of London was more municipal and less parochial and bureaucratic, I cannot help thinking the aid of such bodies as the Society of Arts would be often found very valuable in leading the way to more practical results with metropolitan works.—I am, &c., HENRY WEBBER.

Brewer-street, Golden-square.

To Correspondents.

ERRATUM.—In last *Journal*, p. 736, col. 1, line 14 from bottom, for "Gainsborough" read "Guisborough."

Patents.

From Commissioners of Patents' Journal, October 19*th.*

GRANTS OF PROVISIONAL PROTECTION.

Anchors—2565—D. C. Pierce.
Animal charcoal, revivifying—2460—W. Cormack.
Artificial fuel—2534—D. Barker.
Boats from their davits, detaching—2261—H. A. Bonneville.
Boilers and boiler furnaces—2546—H. Fisher.
Bolts and washers—2524—J. Chalmers.
Brewing, &c.—2416—A. B. Walker.
Brushes—2436—I. Dimock.
Carriage breaks—2414—G. J. Walker.
Chimes—2516—D. Imhof.
Chronometers, &c.—2446—W. Weichert.
Churns—2500—G. Slater.
Compound lenses—2502—J. H. Dallmeyer.
Confectionery—2512—W. and J. W. Wood.
Corn, drying—2486—J. Y. Betts.
Decorticating machines—2519—P. P. J. Martin.
Dies—2438—D. J. Fleetwood.
Door furniture, affixing knobs to spindles of—2492—W. R. Corson.
Drifting and rivetting machines—2499—T. W. Bunning.
Elastic mats and coverings for floors—2541—T. Forster.
Electric currents, transmitting facsimile copies of writings, &c., by—2480—H. A. Bonneville.
Electric telegraph signs, reproducing—2513—W. Clark.
Electric telegraphs—2514—W. Clark.
Fabrics—2422—G. Davies.
Fibre, washing—2557—G. E. Donisthorpe.
Fibrous materials, preparing, &c.—2462—J. Lawson and E. G. Fitton.
Fibrous materials, producing fibres from—2497—H. E. Gilles.
Fibrous materials, weaving—2482—H. A. Bonneville.
Fibrous substances, carding—2563—F. W. Kaselowsky.
Fire-arms—2520—W. la Penotière.
Fish-tail gas burners—2537—M. West.
Fluid meters—2434—J. M. Heppel.
Fluids, filtering—2525—P. R. Hodge.
Fuel—2450—A. F. Stoddard.
Furnaces—2476—H. Aydon and G. B. Jerram.
Furnaces—2494—J. Burgum.
Furnaces—2527—W. Clark.
Gas—2528—P. A. Batchelor.
Grate bars—2559—J. H. Johnson.
Guns, breech-loading—2424—G. Stuart.
Hydraulic presses—2538—J. Daniel.
Imponderable fluids—2536—C. E. Brooman.
Incubators—2567—F. H. Schroder.
Iron and steel—2452—J. Calvert.
Iron and steel, casting—2522—J. Whitworth.
Iron cylinders, casting—2518—J. Gueunier-Lauriac.
Iron ships, sheathing—2495—J. C. Bayley and D. Campbell.
Mattresses—2533—J. Octzmann.
Metallic axles, forming collars on—2561—W. E. Newton.
Milk, preserving—2478—T. Amey.
Motive power—2508—J. S. Johnstone.
Moveable door screens—2412—C. H. Chadburn.
Musical instruments—2468—W. E. Newton.
Oils, distilling—2496—A. V. Newton.
Oils, utilising residues obtained from distilling—2472—J. J. Lundy.
Opaque objects, representing—2550—J. H. Wrench.
Paint, substitute for—2540—W. Hope and H. Browning.
Paraffin oil, lamps for burning—2442—F. R. Mosley.
Pianofortes—2488—G. H. Brockbank.
Pocket-books on the person, securing—2504—F. W. C. Dromatra.
Power looms—2503—E. B. Bigelow.
Railways, permanent ways of—2432—T. A. Rochussen.
Railway switches—2509—J. H. Johnson.
Railway tickets, marking—2545—R. Mortimer.
Railway trains, communication between the guard, engine driver, and passengers in—2542—C. E. Spagnoletti.
Railway trains, stopping—2423—G. A. Laurent.
Reaping and mowing machines—2523—R. Hornsby and J. E. Phillips.
Refrigerators—2526—A. M. Dix.
Resinous substances, solvents for—2418—C. Crump.
Safety belts—2510—C. Fox.
Safety valves—2539—J. R. Swann.
Saws, securing teeth in—2426—W. Clark.
Self-feeding cotton gins—2501—J. A. Chaufourier.
Ships' anchors—2420—J. W. Morgan.
Ships from foundering, preventing—2498—J. E. Thibault.
Ships, pumps for—2474—T. B. Taylor.
Smoke, consuming—2458—H. Turner.
Steam engines—2466—A. V. Newton.
Steam engines—2515—D. Joy.
Steering vessels—2456—A. V. Newton.
Stoves—2448—T. Whitaker and J. Constantine.
Vessels, raising—2547—W. D. Scott.
Water-closets—2532—J. Cavanah.
Water-closets, &c.—2493—T. Lythgoe.
Washing machines—2506—J. and J. Broughton.
Water supply—2428—R. Richardson and J. Imray.
Weaving, reeds or combs for—2444—J. C. Ramsden.
Weights—2430—A. V. Newton.
Window sashes, securing—2511—S. Price.
Woven fabrics, shaping belts of—2555—G. P. Dodge.
Wringling and mangling machines—2440—T. Atkinson, jun.
Wrist, ornaments for the—2569—J. Badcock.

INVENTION WITH COMPLETE SPECIFICATION FILED.

Watchmen, detecting apparatus for registering the time of—2646—J. E. Buerk.

PATENTS SEALED.

1108. G. Lunge.
1112. C. Hastings, J. Briggs, J. Law, and H. Mitchell.
1116. J. Leigh.
1118. J. Allen.
1126. J. O. Ramsbottom.
1132. F. C. Buisson.
1134. J. H. Wilson.
1136. G. E. Donisthorpe.
1137. J. Player.
1138. G. E. Donisthorpe.
1146. E. H. Huch and F. J. Windhausen.
1154. S. Thompson.
1159. D. Biévez.
1173. W. Edmond and A. Gurlt.
1192. J. Howard & E. T. Bousfield.
1194. T. Dixcee.
1196. T. A. Weston.
1206. H. E. Newton.
1207. A. V. Newton.
1311. J. H. Johnson.
1337. W. Hackett & W. Marsden.
1679. P. Barlow.
1938. W. E. Newton.
1971. G. T. Bousfield.

From Commissioners of Patents' Journal, October 23*rd.*

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

2539. J. Shanks.
2572. G. Davies.
2623. W. Betts.
2641. M. Vian.
2683. H. Cochrane.
2590. J. Dodd.
2606. W. W. Burdon.
2607. R. A. Brooman.
2624. E. S. Crease.
2625. J. Davidson.
2579. T. C. Clarkson.
2700. W. Tasker, jun.

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

2334. W. Prosser.
2364. S. Newberry and H. Moore.
2385. A. S. Rott.
2380. J. Higgins and T. S. Whitworth.
2396. J. and H. Bruckshaw, and W. S. Underhill.
2410. G. T. Bousfield.
2414. P. Jones.
2416. W. Fox and J. Willis.

Registered Designs.

Street Lamp—September 29—4815—W. F. Cotton, Dublin.
Blacking Bottle—October 3—4816—G. Baker and Son, Birmingham.
The Carleton Leglet Boot—October 4—4817—R. Carleton, 38, Westmoreland-street, Dublin.
Double-safety Self-fastening Lock, Latch, and Striking-plate for Carriage and other Doors—October 13—4818—W. Dalziel, Creek-road, Deptford, Kent.
Spring Clip or File—October 18—4819—C. Bathor, 28, York-place Portman-square, W.